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AUTHOR Whitley, A. Dan
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ABSTRACT

The presentation was given at a Pupil Personnel Service seminar to familiarize the conference participants with the techniques used by a behaviorist when he consults with a teacher using a classroom observational schedule. The report is divided into three parts: (1) method employed (subjects and setting apparatus, training children, instruction tc volunteer teacher, video taping instruction, experimental conditions, observational schedule, intra-team reliability, graphing data, analysis of specific trial, (2) the results, (3) a discussion. The author suggests that the objectives of counseling services should be to change human behavior, not analyze it and to assess its outcome. (Author/MC)

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A BEHAVIORIST'S INTERACTION ANALYSIS: THE CLASSROOM OBSERVATION SCHEDULE[1]

A. Dan Whitley[2]

Southern Illinois University

A traditional role of the pupil personnel services (PPS) team has been one of consulting with teachers to enhance self-and-environmental evaluations in order to effect an adjustment in students exhibiting maladaptive classroom behaviors. If the team's consulting role is to be a viable and dynamically constructive one, it must be able to provide the teacher with more than just information. It must provide her with concrete recommendations about how to assist her youth to adjust to existing educational and behavioral expectancies. In addition, it should suggest procedures which would actively disrupt the social and educational conditions which have led to the maladaptive behaviors the child has been exhibiting. It may well be the objective of the PPS team to instruct the teacher in how to influence her students' environments so that they become more conducive to the attainment of educational goals.

One of the techniques which this conference has suggested the PPS team utilize in its consulting role with teachers is an interaction analysis. Briefly, as a summation, interaction analysis instruments systematically code verbal responses of students and teachers by a "catalogue raisonné" in order to compare the frequencies of different response patterns (Amidon-Hough, 1967;

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Cooperative Educational Research Laboratory, 1969; Simon & Boyer, 1969). Ideally, such a system could lead to a principle of human behavior with generality to many similar situations subsequent to the analysis of specific patterns of verbal activities. However, generally, the data obtained is useful to the PPS team and teacher only in instituting evaluations within the classroom where the instrument was used. The data which is obtained from such a procedure indicates (1) the amount of verbal interaction, (2) who initiated and received the verbal interaction, (3) who did not interact verbally, (4) the form of verbal interaction, etc. It is important to realize that the systems presently being used do not code nor obtain the frequency of non-verbal communication (responses) such as proximity (nearness of the teacher to a student), smiles, head nodding (both "yes" and "no"), physical contact, eye contact, etc.

Recently a series of applied research studies has been done using non-verbal as well as verbal interactions as independent variables. Illustrative of these are several which have been done using behavior modification procedures (Becker, Madsen, Arnold, & Thomas, 1967; Hall, Lund, & Jackson, 1968; Hart, Reynolds, Baer, Brawley, & Harris, 1968; Madsen, Becker, & Thomas, 1968; Thomas, Becker, & Armstrong, 1968). They have found that children's behaviors can be modified through a variety of techniques. One technique has been the using of such procedures as social reinforcement in order to shape, strengthen, or maintain desirable classroom behaviors. In most instances social reinforcement has been defined as verbal praise, nods of agreement, smiles, and affectionate physical contact by the teacher following desirable

student behaviors. Concurrently, deviant student behaviors are ignored where possible.

Interestingly, a modified interaction analysis system has been employed by the researchers using the behavior modification procedures. However, their instruments and data collection techniques deviate from those covered earlier in our conference in several significant areas. Firstly, their coding systems are idiosyncratic to the needs of the teacher requesting the consulting assistance. This means that the nature of the data collected is determined by the student's behavior and not by a pre-designed instrument. Secondly, data is collected only on the teacher and the student about whom she is concerned (group data is not collected). Thirdly, reliability and validity are determined concurrently during data collection. Reliability measures are obtained by using a second observer seated in a different physical location in the classroom from the first observer and independently recording what he observes. Validity is ascertained by systematically varying the teacher's behavior in a clearly defined topography and observing the effect the changes have upon the student's behavior. Fourthly, since the data to be collected is idiosyncratic from one student to another, only the target behaviors (both verbal and non-verbal) are recorded systematically. All other behaviors are considered irrelevant and are not recorded. This results in a loss of data. Finally, the only stated purpose for which a behaviorist uses his observational recording system (modified interaction analysis) is to identify the existing verbal and non-verbal relationships between the teacher and student.

Once the behaviorist has obtained his data, he analyzes it for relationship factors and subsequently recommends that specific changes take place in the teacher's behaviors to bring about changes in the student's behaviors. These recommendations are not global but instead appertain to specific student-teacher response patterns. Remember, one of the primary assumptions upon which the behaviorist's approach is based is that by manipulating the teacher's social reinforcement timing and frequency, the child's behavior can be changed. This assumption has been documented with research from: school classrooms (Becker, Madsen, Arnold, & Thomas, 1968; Madsen, Becker, & Thomas, 1968; Thomas, Becker, & Armstrong, 1968); and experimental nursery schools (Allen, Hart, Buell, Harris, & Wolf, 1965; Bijou & Baer, 1963; Hart, Reynolds, Baer, Brawley, & Harris, 1968).

The purpose of the remainder of this presentation will be to familiarize the conference participants with the techniques used by a behaviorist when he consults with a teacher using a classroom observational schedule.

Method

A group of sixteen children was trained to be attentive and non-attentive on cue, and to communicate their attentiveness and non-attentiveness to a teacher presenting an Ojemann story (Ojemann, 1967). The teacher was not aware that the children were serving as the experimenter's collaborators. A simultaneous split-screen video tape recording of twenty minutes duration was made of the classroom action. The conference participants were then

trained in the use of a classroom observation schedule via lecture-discussion and observation-recording of a sample of the video tape. Following the training, the conference members were assigned to five PPS teams (each consisting of an administrator, elementary and secondary counselor, school psychologist, school social worker, and in some instances a school nurse). Each team was assigned a different child to observe (and record his responses) using their observation schedules. Concurrent observation-recording was done of the teacher's behaviors also. The five teams then were shown the entire video tape simultaneously and requested to obtain their assigned data. Each team then compared their observational schedules and computed an intra-team reliability coefficient. Subsequently, the teams were shown how to graph the data from the observational schedules. Finally the total group was asked to analyze their results and determine what had occurred.

Subjects and setting. Sixteen volunteer children, ten boys and six girls whose ages ranged from four through fifteen, were video taped. They were children of the parents in attendance at the conference. Video taping was done in a conference room whose dimensions and interior resembled a classroom. Portable chalkboards were provided and the teacher had a desk and chair situated at the front of the classroom.

The teacher was a member of the conference who volunteered his services. His previous experience included the teaching of high school social studies and language arts. He had recently been appointed to a high school principalship.

Apparatus. The Concord video tape recording equipment used in filming the classroom presentation consisted of: a Model 600-1 Video Tape Recorder, one Model 20 Television Camera-Monitor with zoom lens mounted on a dolly and tripod, one Model 700 Monitor-Receiver, one Model D-620 Dynamic Microphone, one Model TCP-Z Special Effects Generator, one Model 18 Camera, and one forty-minute reel of half-inch tape. Playback of the video tape to the conference audience was done on a Concord Model 900, twenty-two inch monitor-receiver.

Figure 1 shows the classroom observation schedule used in the presentation. The symbols representing child and teacher behaviors are self-explan-

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Insert Figure 1 about here

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atory. Each observation interval consisted of ten seconds observe and five seconds record. Observation recording was continuous for five minutes.

Procedure.

Training of children. Studies done by Kennedy and Thompson (1967) and Krumboltz, Varenhorst, and Thoresen (1967) have strongly suggested that in a counseling setting the ability of the counselor to pay attention to his counselee may determine the quality of the relationship. In effect their studies are suggesting that the counselor's ability to socially reinforce the client controls the client's responding behaviors in the counseling interview. Subsequently, it was decided to train the children in this presentation to attend and non-attend on cue and observe the effects their behaviors had upon the "volunteer

teacher". Our assumption was that by manipulating the children's social reinforcement timing and frequency, the teacher's behavior could be changed. Training focused upon several social reinforcement (attending) responses; vertical head nodding ("yes"), smiling, leaning forward toward the teacher, eye contact with the teacher, hand raising, and answering questions correctly. Non-attending behaviors were defined as the withdrawal of the attending behaviors (e.g., do not raise hand, answer questions inaccurately if called upon, avoid eye contact, do not smile, slouching in chair, whispering to neighbors, leaving chair, etc.). Training consisted of using role playing techniques where the children emitted specific behavioral responses upon cue by the experimenter. A visual cue card was used. Two 20 minute training sessions were held prior to the video taping.

Instruction to volunteer teacher. The volunteer teacher was given a copy of the Ojemann story he was to use and was told:

> "Please present the story in a semi-structured manner. The purpose of the presentation is to parallel a normal classroom situation where reading and open-ended-discussion are used as instructional medias. You could consider your class to be a guidance discussion group, or a social science class. We are interested in making an analysis of the behaviors that the children and you exhibit during the presentation. Therefore, a video tape will be made of the class proceedings. It will be used at a later time to train the conference members in the use of certain instruments."

Video taping the instruction. One camera was mounted behind the teacher's desk and faced toward the children. The experimenter presented his cue cards to the children from this position, thereby preventing the teacher from becom-

ing aware of their presence or purpose. The camera-monitor with zoom lens, mounted on a tripod and dolly, was placed at one side of the room. Its operator was able to film both teacher and children as the need arose. The remaining equipment was situated on a table near the camera-monitor. Video taping was initiated as soon as the teacher entered the room and terminated at the conclusion of his presentation.

Experimental conditions. Originally it was planned to have ten minutes of attending behavior, ten minutes of non-attending behavior, and ten minutes of attending behavior. However, during the non-attending condition the children's behaviors began to have such a marked effect on deteriorating the teaching environment that the condition was terminated at the end of five minutes. The final attending condition was terminated after approximately six minutes.

Using the observational schedule. In order to simplify training only two child behaviors were recorded: out-of-seat and talking-out. Both are defined on the observation sheet (see Figure 1). Five teacher behaviors were recorded concurrently with the children's. The observation sheet contained room for twenty minutes of observing-recording consisting of four five-minute time blocks. Each minute contained four squares each of which represented fifteen seconds. The first row was used to record the child's behavior. Teacher behavior was recorded in the second row. The procedure employed consisted of watching the teacher and child for ten seconds then recording what was observed within the next five seconds. At the end of five continuous minutes of this procedure, a short rest was allowed before reinstituting the observation-

recording system.

To reduce confusion and insure timing reliability, the experimenter called out the observing and recording intervals. For example, he would say: "Begin observing" (at the beginning of each fifteen second interval) and "Begin recording" (at the end of the first ten seconds of each fifteen second interval). Timing was done with a stopwatch.

If a target child was out of his seat during an observation interval, an "O" was recorded for that interval. If he talked-out, a "T" was recorded. If both behaviors had occurred, then an "O" and a "T" were scored. Figure 2 is a sample from an observational sheet. In the second one-minute observation period the following transpired: (a) first fifteen seconds; the child was out of his seat and the teacher verbally admonished him, (b) second fifteen second period; the child talked-out and the teacher verbally admonished him, (c) third fifteen second period; the child behaved (X) and the teacher did not respond to him, therefore her interval is blank, and (d) the fourth fifteen second period; the child talked-out and the teacher verbally praised him.

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Insert Figure 2 about here

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Computing intra-team reliability. Intra-team reliability coefficients were computed by a percent agreement method in which number of agreements were divided by the total number of time intervals (Bijou, Peterson, & Ault, 1963).

Graphing of data. There was not sufficient time to have each team draw a

graph of its own target student and teacher interaction pattern. Subsequently, a similar graph was shown and explained to the group at large (see Figure 3). Figure 3 shows the results of a study done in a classroom on a child who disrupted his class by being out of his seat and talking out frequently.[3] The object of the study was to alter his behavior by reducing the number of times the

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Insert Figure 3 about here

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teacher attended to him following the disruptive behaviors while increasing the number of times she socially reinforced him following desirable behaviors. The upper half of the figure indicates the number of teacher responses following desirable and undesirable student actions. The responses observed were similar but not identical to those in the conference video tape. The frequencies of the teacher's responses are shown by a bar graph.

The child's behavioral responses are graphed in the lower portion of the figure. The data is reported as percent of intervals in which disruptive behaviors occurred. The process for computing the percentages for each trial was: (a) determine the total number of observation intervals (80 on Figure 1 = four intervals per minute x five minutes equals 20 intervals per five minutes x 5 - five minute observation blocks), (b) count the number of fifteen second periods in which talking-out occurred, repeat for out-of-seat, (c) divide the number of intervals in which the child talked-out by the total number of intervals, (d) divide the number of intervals in which the child was out-of-seat by the total number of intervals, and (e) divide the number of intervals in which

the child did not talk-out or did not leave his chair by the total number of intervals. The subsequent findings were then graphed for each trial (day's session).

Analysis of a specific trial. Occasionally it is desirable to graph a given trial in a different manner in order to analyze relationships between student and teacher behaviors. For example, refer to session ten on Figure 3. During the treatment condition, Contingent Teacher Attending One, the child's positive progress deteriorated markedly. In this particular case a question was raised as to what had caused the reversal. Subsequently, a cumulative graph was made. The graph disclosed that the teacher was not being consistent in following the treatment of socially reinforcing the child only after desirable behavior emissions. Figure 4 is a cumulative graph of the data

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Insert Figure 4 about here

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recorded in Figure 2. Graphing of the child's responses consisted of plotting his out-of- seat and talking-out behaviors with a horizontal point. If he did not engage in either of these behaviors during a fifteen second interval, then a vertical dot was plotted. Subsequently, a horizontal plot represented undesirable behaviors while a vertical plot represented desirable behaviors.

If the teacher responded to the child during an interval then a check mark was made beside the child's dot. If she did not respond, then no check mark was made. Let us assume our objective was to induce teacher attending only after periods where the child remained seated or did not talk out. Graphically

this system would disclose check marks beside dots only when the dots were vertically plotted.

Inspection of Figure 4 shows that in most instances the teacher was responding to the child only when he was disruptive. During the first, second, and third minutes, she did not respond to him while he was behaving. However, in the fourth minute she did attend to him following his desirable behaviors during three of the four fifteen-second intervals (notice the three dots with check marks beside them). This type of inconsistency is what the cumulative graph can show which the bar graph (Figure 3) cannot.

Figure 5 is another example of a cumulative graph. It graphically represents the effect that token reinforcement had upon increasing cursive writing responses in a fourth grade student who preferred printing.[4] In this figure a vertical plot represented the number of cumulative tokens the child earned for

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Insert Figure 5 about here

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cursive writing. However, a vertical plot with a different symbol also represented the frequency of printed responses. The data as it is graphed shows that after the first three days (Baseline 1) printing never re-occurred. The important point is for the reader to analyze the difference in graphing techniques between Figure 4 and Figure 5.

Results

As a consequence of employing a combination of instructional techniques including lecture, discussion, and demonstration five multi-disciplinary pupil

personnel services teams were trained to analyze a structured video tape of a classroom interaction. Their analysis of data recorded on an observation schedule and transformed into graphic form disclosed that each team's target child was exhibiting similar topographical behaviors during the same time periods. They subsequently deducted that the children had been trained to respond to the instructional process with certain behaviors.

There was general agreement among the teams that during two attending conditions the teacher looked at the children frequently, kept his voice level fairly uniform, paused infrequently, and asked questions at a high rate. However, when the class reverted to a non-attending state, he frequently raised his voice, used long pauses, asked fewer questions, pointed his finger at the class, and verbally admonished the group. It was also noted that the teacher was obviously an experienced professional as he continued to use positive verbal reinforcement intermittently throughout the instruction. He also did not immediately alter his instructional response patterns when the non-attending condition was instituted.

One team's target child, a four year old, was unable to successfully emit non-attending behaviors following the first experimental attending condition. Instead, he continued to raise his hand, nod his head "yes", smile, maintain eye contact with the teacher, and answer questions. During the last two minutes of the non-attending condition his behaviors almost completely dominated the teacher's attention. The teacher smiled frequently at him, leaned forward across his desk in his direction, asked the class to be quiet so he could hear

him, asked him additional questions, etc. Evidently, a mutually reinforcing state of affairs between the two resulted in a temporary social splinter group.

Discussion

A casual survey of contemporary models of interaction analysis would disclose a multiplicity of conceptual theories, each suggesting their process attains better results than their peers. A closer inspection of the various approaches, however, discloses that the apparently multifarious systems proceed along a single procedure: they all deal with only verbal behaviors in groups of people. The procedures outlined in this presentation dealt with techniques applicable to two subjects and their verbal and non-verbal interactions. It also differed from the interaction analysis systems presented earlier in the conference in that the exact form and nature of the interactions which are observed and recorded are determined by defining behaviors which are to be changed. This system clearly infers that the data which is collected will be analyzed for the purpose of instituting a change in one of the interacting agents in order to bring about a change in the second agent. This, of necessity, requires evaluations by the assessor.

As the concept of pupil personnel services comes of age, it is apparent that there is an urgent need for reflection about what the various specialists could do for the persons receiving their services. In particular, some concern must be focused upon the unique blending together of the multi-disciplinary professional competencies. One school of thought is arguing that this theoretical model can meet the needs of a greater number of secondary and elementary

school children. Proponents of this school feel that the PPS team is more than the sum of the capabilities of the individual team members. Opponents to this school of thought feel that we should continue to generate esoteric knowledge germane to the capabilities of individual professional disciplines, each functioning in a semi-mutually exclusive manner.

It is important in analyzing both schools to become aware that each often advocates similar roles for their professionals. For example, consulting with teachers, administrators, parents, and the child is a universal concept. It is our position that this is a valid role contingent upon operationally defining its objectives, procedures, and outcome. Thus, a position has been suggested in this paper that the objective of consulting services should be to change human behavior, not merely analyze it. Other primary objectives of consulting services concern assessing its outcomes. Hopefully, a teacher who participates in the consultation process with the PPS team will acquire knowledge which will help her in the future to: (1) be able to deal with similar type problems early in their inception, and (2) prevent similar problems from occurring in her classroom.

One of the problems encountered in using the observational classroom schedule advocated in this presentation is a loss of data caused by (1) the limited number of persons being observed, and (2) the limited number of behaviors recorded. It seems logical that if a PPS team were actively engaged as a unit

in obtaining data that this shortcoming could be avoided. In addition, a recent series of studies (Ivey, Normington, Miller, Morrill, & Haase, 1968) on the training of therapeutic professionals through a microcounseling procedure using video equipment has implication for all interaction analysis systems. The findings of the studies were that basic counseling skills could be behaviorally defined and acquired in a shorter period of time through the use of video equipment. If we generalize these findings to the objectives of the consultation process, they suggest that perhaps we should use video equipment to perform an interaction analysis and to train the teacher to alter her behaviors. The concept of vicarious learning and pictorial models has been well established by research (Bandura, 1969; Bandura & Walters, 1963).

In conclusion, the use of interaction analysis systems by PPS teams requires more research. The research designs employed should allow a simultaneous consideration of student and teacher behaviors in both the verbal and non-verbal domains as they relate to specific measures of outcome. The advantage of doing research of this type on interaction analysis systems is that we could ascertain through repeated trials which interaction analysis strategy was most effective in predicting and changing human behavior. Very few of the present systems allow for a simultaneous retrieval of data on child characteristics, interaction (treatment) strategy, and outcome measures.

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Footnotes

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2. Now Elementary Guidance Supervisor, Department of Pupil Personnel Services, Office of the Superintendent of Public Instruction, State of Illinois.
3. A copy of this study can be obtained by writing the author.
4. A copy of this study can be obtained by writing the author.

Figure Captions

Fig. 1. Classroom observation schedule for simultaneous recording of specified student and teacher behaviors.

Fig. 2. A sample excerpt from a classroom observation schedule.

Fig. 3. Graphic analysis of specific teacher and student responses by experimental condition.

Fig. 4. Cumulative graph of teacher and student responses from Figure 2.

Fig. 5. Cumulative graph of tokens earned for cursive writing and incidences of printing responses by condition.

CLASSROOM OBSERVATION SCHEDULE

Student _____ Observer 1 _____

Date _____ Observer 2 _____

Location _____ Time _____

Teacher & Grade _____ Subject Matter _____

15" Intervals = Observe 10", Record 5"

STUDENT SYMBOLS

O = Out of seat (Leaving his chair or seated position during a lesson without permission of teacher).

T = Talking out (Talking or whispering without teacher's permission. Observer must be able to hear verbalization. Includes talking to others or self while teacher is speaking, calling out teacher's name without raising a hand and being recognized, volunteering answers without raising a hand, also whistles, coughs, laughs, screams, etc.

X = Behaviors other than O or T.

TEACHER SYMBOLS

1. Physical contact - embracing, kissing, patting, holding hand or arm, holding in lap.
2. Verbal Positive - statements of affection or praise.
3. Verbal Negative - yelling, scolding, raising voice, belittling, making fun of students, threats.
4. Facial - smiled, winked, nodded.
5. Proximity - teacher standing or walking within one classroom desk space of the student.

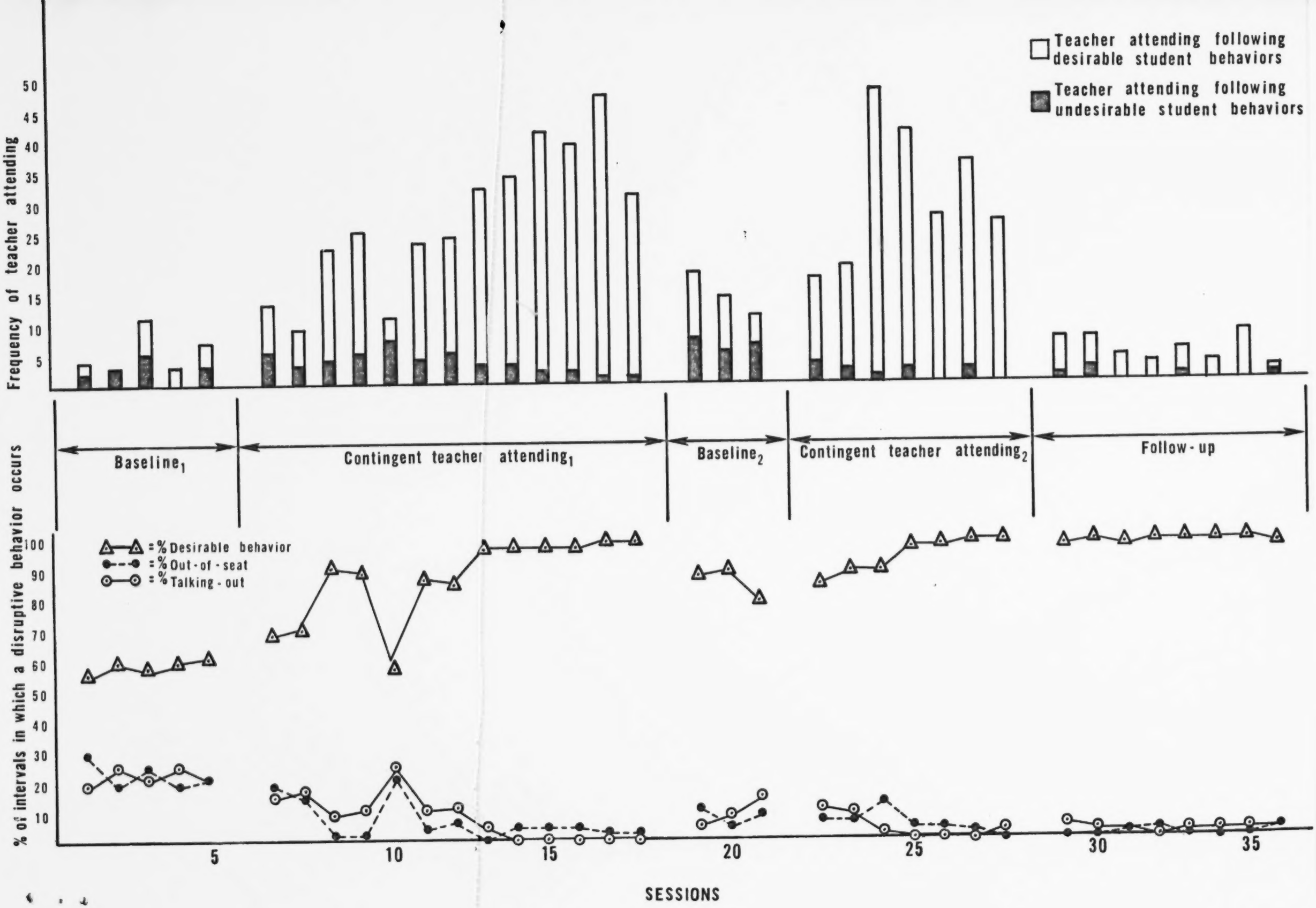
	1st Min.	2nd Min.	3rd Min.	4th Min.	5th Min.
Student					
Teacher					

Student					
Teacher					

Student					
Teacher					

Student					
Teacher					

	1st Min.				2nd Min.				3rd Min.				4th Min.				5th Min.			
Student	T	T	X	X	O	T	X	T	X	X	X	T	X	X	X	X	X	T	T	T
Teacher	5	5			3	3		2				2		1	4	2		5	3	4


Teacher attending following desirable student behaviors
Teacher attending following undesirable student behaviors
Frequency of teacher attending
50
45
40
35
30
25
20
15
10
5
Baseline1
Contingent teacher attending1
Baseline2
Contingent teacher attending2
Follow-up
% of intervals in which a disruptive behavior occurs
= % Desirable behavior
= % Out-of-seat
= % Talking-out
100
90
80
70
60
50
40
30
20
10
5
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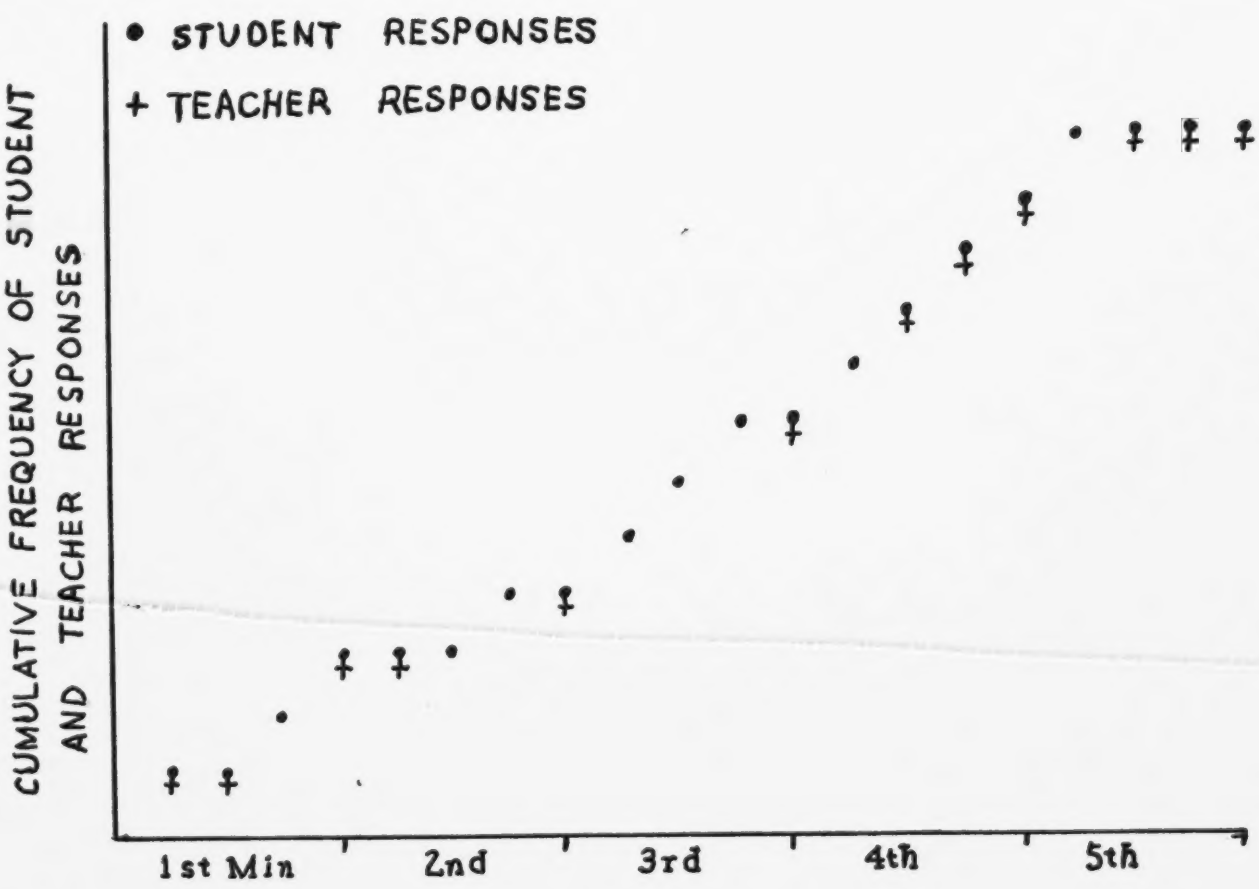
35
SESSIONS


• STUDENT RESPONSES
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CUMULATIVE FREQUENCY OF STUDENT AND TEACHER RESPONSES
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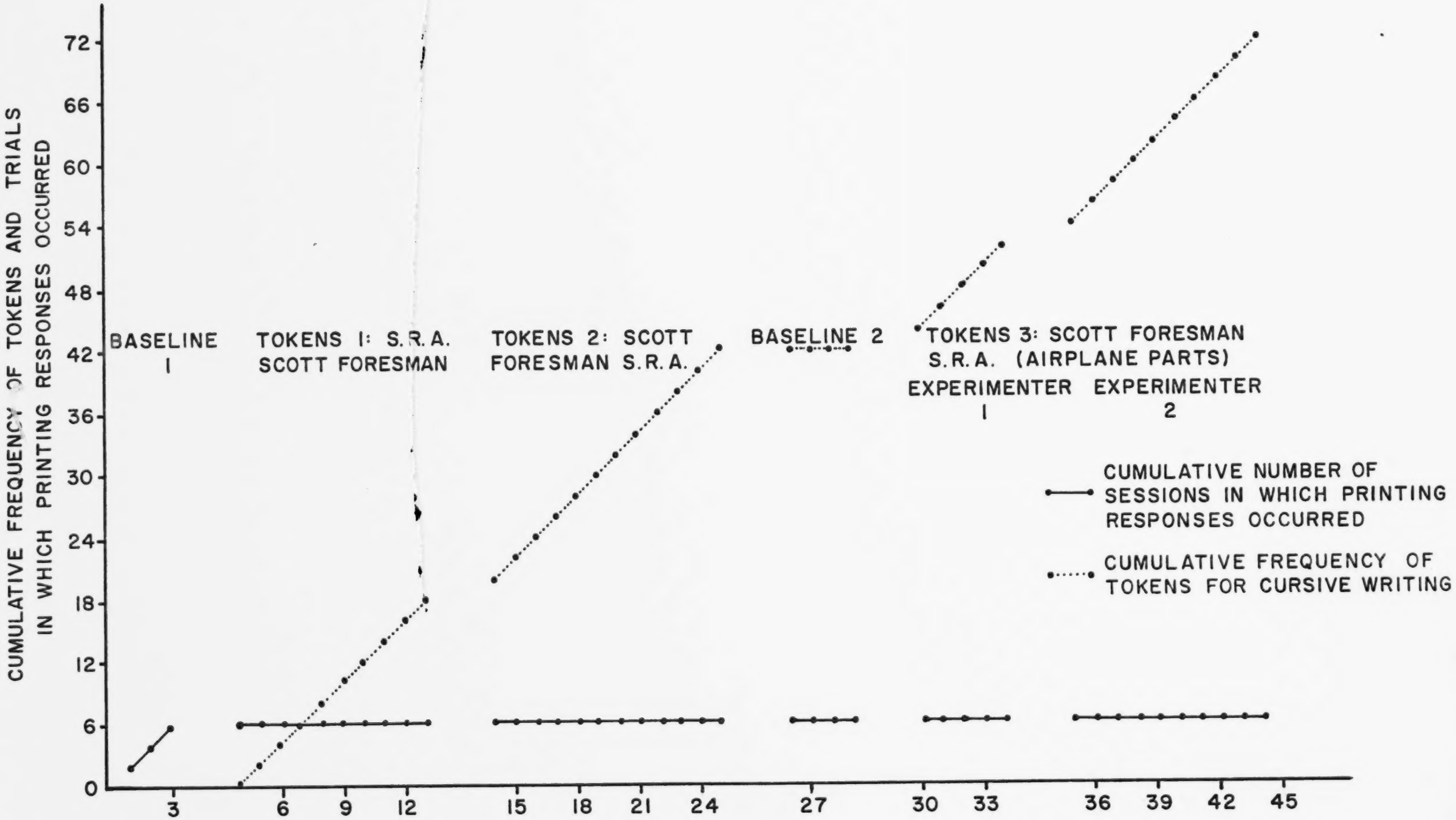
CUMULATIVE FREQUENCY OF TOKENS AND TRIALS IN WHICH PRINTING RESPONSES OCCURRED
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72
3
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12
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36
39
42
45
BASELINE 1
TOKENS 1: S.R.A. SCOTT FORESMAN
TOKENS 2: SCOTT FORESMAN S.R.A.
BASELINE 2
TOKENS 3: SCOTT FORESMAN S.R.A. (AIRPLANE PARTS)
EXPERIMENTER 1
EXPERIMENTER 2
CUMULATIVE NUMBER OF SESSIONS IN WHICH PRINTING RESPONSES OCCURRED
CUMULATIVE FREQUENCY OF TOKENS FOR CURSIVE WRITING

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